more especially Spinoza and Leibniz—are exceptionally well treated, and of the teachers who drew their inspiration from Kant, Fichte and Herbart, and particularly Schelling and Schopenhauer, are handled sympathetically and with discrimination.

Prof. Weber's book has the defects of its qualities. The amount of space allotted to some of the greater philosophers, such as Plato and Aristotle, is restricted, and they are dealt with rather as exponents of phases in development than as thinkers whose positive solutions of the problem are of enduring interest. Thus the *Phædrus* is summed up as "opposing the selfish rhetoric of the sophists with the true eloquence of the philosopher, whose chief object is the knowledge of the invisible world." There is a technical mistake in saying that Aristotle's "first philosophy" has for its object "the queen of the categories—substance." The biological point of view, which is so pronounced in Aristotle, is not brought out, and, in general, it is Aristotle as he influenced later philosophy that Prof. Weber presents to his reader. In the statement that "the *matter* of Plato, Aristotle, and Plotinus is not the matter of the materialists, but what Schelling and Schopenhauer would call *will* or the will-to-be," the suggestiveness is, in part at least, that of a *suggestio falsi.*

In his treatment of Kant, too, Prof. Weber has the after-development so vividly before him that the exegesis of the first *Critique* is somewhat injuriously affected. "Prior or *à priori* to" is, as Prof. Weber uses it, an incorrect phrase. The distinction between image and schema is lost by loose terminology. And, as is perhaps natural, the Refutation of Idealism is slurred as non-essential. Indeed the issue, as between Kant and Berkeley, is not understood; and it is significant that in the account of the latter the *Siris* is not mentioned. Berkeley, that is to say, is labelled idealist and a precursor of Hume, and his own intellectual development has no account taken of it. Another notable omission in the modern period is in the case of Lotze, who is just named and dismissed.

On the other hand, the scholastic period, which has devoted to it a larger proportion of space than is usual, is covered with some success, Prof. Weber's theological and ethical interests giving life to the inquiry. Anselm is admirably handled.

The translation is from the fifth French edition of the Strassburg Professor's book. The American translator has added in notes and appendix an adequate bibliography, without criticism, and with a not unnatural preference for transatlantic editions and translations.

Many of Prof. Wundt's metaphysical views were familiar to the world even prior to the appearance of his "System" so long ago as in 1889; and to offer an appreciation in detail of a well-known work by so great a teacher would be at once an impertinence and an anachronism. In welcoming, however, the second revised and slightly enlarged edition of the "System," it is perhaps permissible to recall some of its characteristics.

Prof. Wundt's idea of a philosophical system is a connected view of existence which shall satisfy both the demands of the understanding and the needs of feeling. It must be strictly *meta*-physical, after and based upon the experiential sciences. Its method may be described, perhaps, as a criticism of working categories, passing from conceptions of the understanding to the transcendent ideas and finding, as the end of the *Regressus* in each limited field, an inadequate point of view which needs supplementing, until we reach our Ontology. The basis of this is Will. But Prof. Wundt can as little accept what he calls Universal Voluntarism as he can the *intellectus infinitus.* Will, without something to will or without a relation of interaction in which to realise itself, is void, abstract, and not will as we know it. The solution of the problem he finds in a system of relatively independent wills in whose interaction ideas (*Vorstellungen*) arise. The principle of unity lies in the moral ideal of humanity. Collective will is a reality, but not in the sense of the school which derives from Schopenhauer.

Prof. Wundt is more happy, however, in his criticism of particular categories. His treatment of purposiveness in organic evolution is quite masterly, though he attaches somewhat too much importance to what he calls *Heterogonie* of ends. In this edition he refers specially to the controversy between Prof. Weismann and his critics in its most recent form, and declares definitely in favour of use-inheritance, though he draws a distinction between the suddenly acquired qualities of an individual and the gradually acquired characters which have become ingrain by like response to like stimulus repeated from generation to generation. He notes with some candour that it might in theory be maintained that the latter are transmitted because they alone are able to affect the germ-plasm. We do not venture to deal with Prof. Wundt's *Holoplasma* and its relation to the views of Nägeli.

The book stills lacks an index, a deficiency specially annoying since the same and allied subjects are taken up under more than one heading. H. W. B.

THE CORAL REEFS OF SAMOA.

Ueber den Bau der Korallenriffe und die Planktonvertheilung an den Samoanischen Küsten nebst vergleichenden Bemerkungen. By Dr. Augustin Krämer. With an appendix "Ueber den Palolowurm," by Dr. A. Collin. 8vo. Pp. ix + 174. (Kiel and Leipzig: Lipsius and Fischer, 1897.)

DANA'S main contribution to the Darwinian theory of coral reefs was a persuasive argument based on the geographical distribution and varying size of atolls and reef-grounds. Darwin had shown that if his theory were true, its most important corollary was that certain lines across the Pacific Ocean were lines of subsidence, and that others are either rising or stationary. Dana pointed out that as we approach the supposed lines of subsidence the areas of the coral reefs diminish, islands of non-calcareous rocks disappear, and the coral islands all become atolls, which gradually contract in size; after this comes a tract of sea without islands, and of great depth. Then, the axis of subsidence having been passed, small atolls reappear, the reverse series of changes occurs, until we reach an area of broad fringing reefs round some rocky island. Dana's most striking illustration of this method of reef distribution was the archipelago of Samoa, in which he described a gradual

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passage from the westernmost, rocky island of Savaii eastward, past reefs of diminishing size, to the last member of the group, the small Rose Atoll. Beyond that island there are some 900 miles of open sea, until the small atolls of the Society Islands begin another series leading up to the great Paumotu Archipelago. Dana explained the distribution of the reefs by assuming that the line between Rose Atoll and the Paumotus had rapidly subsided. This suggestion was in harmony with all the known facts. It has been the argument least shaken during the discussion on Dr. Murray's theory, and has accordingly kept some men firm in the Darwinian faith. Funafuti was originally recommended by the original Coral Island Boring Committee as a suitable site for bore-hole, after it had been tested by this principle in order to minimise the chance of stumbling on an area of rising sea-floor.

Now, however, Dr. Krämer, in a detailed description of the Samoan reefs, shows that the facts are not exactly as stated, and that another explanation is available. Dr. Krämer's book opens with a sketch of the literature on the coral reef controversy, which is neither complete nor altogether accurate; for he numbers Admiral Wharton among the defenders of Darwin's theory, and Prof. Sollas among its opponents. He then gives an account of the topography, meteorology and geology of the Samoan group, after which follows a detailed description of the coral reefs. The next section of the book discusses the conditions which determine the limits of coral-reef formation, and in which the most original remarks are those dealing with the influence of heliotropism. (His observations on heliotropism in corals have, by the by, an important bearing on the question of the validity of coral species founded on the nature of the corallum.) He concludes his contribution to the reef controversy by a chapter entitled "a new view of the origin of atolls." Dr. Krämer points out, during his description of the Samoan reefs, that they are not disposed exactly as they should be to agree with Dana's suggestion, that the eastern end of the archipelago is undergoing rapid subsidence. The reefs are not as regularly arranged as has been thought. Proceeding from west to east, Savaii has no very extensive reefs except on the east coast; Upolu, the next island, has large fringing reefs at the west end, fringing and small barrier reefs in the middle section, and unimportant fringing reefs at the east end; Tutuila has only a fringing reef on the southern shore, and two submarine barrier reefs further out; Manua has no important reefs; finally, the easternmost island of the chain is Rose Atoll. These facts appear conclusive that the Dana argument will not hold for its typical locality.

Krämer then proceeds to discuss the origin of the remarkable shapes of atolls, which Darwin thought it was impossible to explain on the view that atolls formed either on the rims of volcanic craters or on submerged banks. Krämer invokes the aid of great geyser eruptions, in order to widen the bases and alter the forms of submarine volcanoes. He points out that the distribution of volcanic ejectamenta depends not only on its specific gravity, for ocean currents and tides carry the material and pile it up in the dead water to the lee of volcanic islands. He reproduces a chart from Dana, showing how the trend of the coral archipelagoes agrees with that of the ocean currents in their neighbourhood; and he supports this by similar charts of the Paumutu and Marshall Islands. The difficulty of deep lagoons he explains by assuming that atolls with such, originated on crater rims; and he is more inclined to Murray's solution theory than are most writers on coral islands, although he remarks that it does not seem sufficient by itself.

The concluding section of Dr. Krämer's book deals with some biological problems of the Pacific Ocean. A few pages are devoted to the reef fauna, considered in reference to its ethnological relations, and then follows a longer account of the Plankton. The author describes his apparatus and methods at some length. The most interesting result given in this section of the book are his statistics of the comparative poverty of the tropical Plankton compared with that of the temperate zones. In an appendix on the Palolo, a worm largely eaten by the Samoans, Tonguese and Fijians, Dr. Collin re-describes its structure from excellent material collected by Dr. Krämer. He agrees with Quatrefages and Ehlers that it is a member of the genus *Lysidice*, and that Gray's genus, *Palola*, must be given up. J. W. G.

OUR BOOK SHELF.

A Treatise on Practical Plane and Solid Geometry. By T. J. Evans and W. W. F. Pullen. Pp. vi + 400. (London: Chapman and Hall, Ltd., 1897.)

In these 400 pages the joint authors present the student, particularly the one who wishes to restrict his work to the Science and Art Department syllabus of the honours stage of the annual examination held in geometry, with the solutions of a series of problems arranged in an orderly and progressive manner. The problems are, for the most part, those which have been set at the examinations held during the years 1887 to 1896, and their solutions are accompanied, in many cases, by useful hints. There are also included the theories of isometric projection, shadows, and perspective, and several interesting miscellaneous examples, besides some of the less difficult problems which are of fundamental importance. It is not advisable for a student to limit himself entirely to the reading of such a book as this, but using it in connection with a good text-book its value will be very much enhanced: for this reason, the authors have made ample references to existing standard works. No less important are the excellent and clearly printed figures, to the number of 200, which accompany the text; these should be well studied, and, in most cases, re-drawn by the reader himself. For advanced students and teachers this collection of problems and proofs will, without doubt, prove a most useful help in their work.

Les Transformateurs de tension à courants alternatifs. By F. Loppé. Pp. 206. (Paris: Gauthier-Villars. Masson and Co.)

Électromoteurs et leurs Applications. By G. Dumont. Pp. 183. (Same publishers.)

Électro-métallurgie. By A. Minet. Pp. 195. (Same publishers.)

These books are the three latest additions to the well-known series published under the title of the Encyclopédie scientifique des Aide-Mémoire. All the volumes in the series have proved handy and serviceable to students of science and technology.

The first part of M. Loppé's work deals briefly with the theory of the transformer, and ideal conditions of construction; the second part is devoted to the classification of transformers, details of construction, the

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